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THE POLITICS OF UNIX

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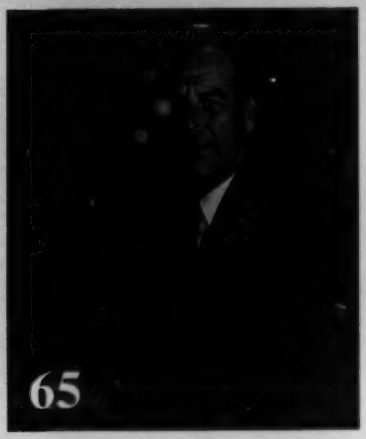

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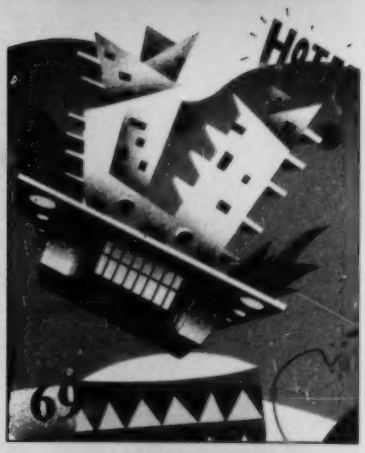

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EDITOR'S MESSAGE

Magnificent Seven?

People in the outside world don't believe me when I tell them how information technology standards are established—such as in the case of the Open Software Foundation and Unix. For instance, they don't believe seven CEOs from major American and European companies who battle one another in the marketplace 364 days a year can suddenly walk into a room, throw $90 million on the table and proclaim, "By God, we're in this thing together."

I have trouble with this myself. But as you'll read on page 55 of this issue, thanks to senior editor John Soat's diligent rendering of a story project that began months ago, the stage has been set for the premiere of the Open Software Foundation—or something like it—for some time. There was even a villainous, despotic alliance, cast right out of *Star Wars*. This goes to press while the AT&T/Sun partnership's response to OSF, whatever it will be, is still in the boost phase. However, the interim is perfect for savoring the vignette of IBM chief John Akers's attempt to look inconspicuous at the OSF press conference, sitting up there among the righteous offended. Give him credit—this is perhaps the one role IBM managers have never rehearsed.

Akers was really there to drop the other shoe. Few paid much attention when the first one dropped in February, giving shape and a time line to IBM's strategic development plans for AIX, its Unix variant. However, IBM executive vice president Alan Krowe, who answers only to Akers, happened to be speaking at an IBM-sponsored meeting of telephone company information managers in Florida on the occasion of the AIX announcement. Krowe informed his audience that the "two worlds of SAA and Unix" would dominate the operating environments of the '90s. Krowe even went so far as to envision an "85 percent similarity" in user interface screens between the SAA and Unix environments. While IBM's press relations contingent later took pains to point out the "personal" nature of Krowe's vision, one got the impression that it was hardly an impromptu flight of fancy.

Now AIX is the core for OSF's development activities. I guess the moral is: If you need help getting across the street, hire a Green Beret.

Robin Nelson

Cover Illustration:
Bryan Haynes

THE SOUND AND FURY OF FUTURES

Last year, most large-systems players concentrated on getting ready for the future. For some, that future is close at hand.

by Robert Moran

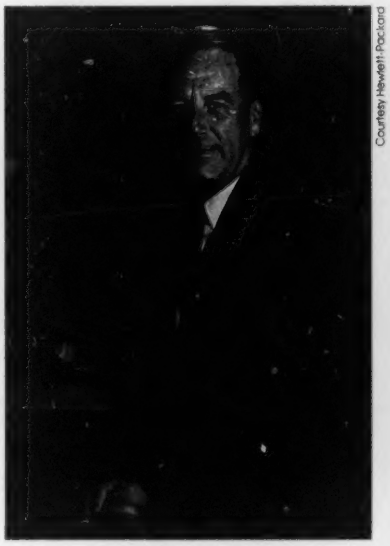
The excitement emanating from the large-systems arena in 1987 centered primarily on platforms and products holding more promise for the future than utility for the present—witness IBM's Systems Application Architecture, the Macintosh-to-VAX link of Apple Computer Inc. and Digital Equipment Corp., and the foray by Hewlett-Packard Co. into RISC technology. The fact that large-systems leaders pumped more resources than usual into research and development last year added to the "futures" bent of the market.

In preparing for the years to come, however, systems and peripherals makers didn't forsake the present. Few vendors starved; some grew modestly, and a couple even prospered royally. Among the top performers last year in the large-systems market was DEC, which rode a 23 percent increase in revenues to overtake Unisys Corp. as the number-two supplier of large computer systems, according to DECISIONS' annual market survey. DEC, which is second only to IBM now, showed profits of nearly $1.3 billion. Although DEC's first-quarter performance this year was flat, analysts expect the company to pick up the pace with its new VAX 6200 series.

DEC's strong performance did little to shrink the huge gap between IBM and the rest of the pack, however. Despite only a 6 percent revenue increase over 1986, IBM managed to garner more than $5.2 billion in profits, even after massive R&D and operating expenditures.

IBM's performance came as no surprise to industry analysts. Bob Djurdjevic, president of Annex Research (Phoenix) and a DECISIONS columnist, expected 1987 to be IBM's "trough year," principally because John Akers, IBM's chairman and CEO, inherited what Djurdjevic calls the massive overexpansion of the 1980s. Last year, Akers began to make his presence felt, cutting back expenditures and reversing policies and trends set by his predecessors. Djurdjevic adds that IBM's 6 percent growth in 1987 may be misleading. According to him, IBM made a substantial inventory write-off in the fourth quarter of 1986, which negatively affected earnings for that year. In Djurdjevic's estimation, IBM's business in 1987 was essentially flat, if not slightly down, compared with 1986.

IBM's presence is implied in all three categories of DECISIONS' large-systems and peripherals survey. In the survey, each company is ranked by total data processing revenues and placed within the category that yields its largest dollar volume. Plug-compatible manufacturers reach into other categories as well, although collectively they represent only 15 percent of IBM's share in any given market.



Courtesy Hewlett-Packard

HP CEO John Young

Last year, HP spent $900 million, or 14 percent of its revenues, on research and development.

PCMs in the news

Among the PCMs, three major stories unfolded last year. Amdahl Corp. showed outstanding revenue growth. Memorex Corp. and Telex Corp. merged to create the largest of the PCMs. And Storage Technology Corp. emerged from serious financial troubles with relatively respectable profits of $26 million.

According to Djurdjevic, Amdahl, on the strength of a 28 percent growth in revenue, became only the second PCM ever (Storage Technology was the first) to operate at a 10 percent profit margin. Amdahl's success can be attributed to the fact that 1987 was the first year that it shipped its mainframes in full volume, as well as to prudent cuts in manufacturing expenses, says Djurdjevic. One way that Amdahl keeps its R&D costs down is by sourcing its disk drives from Japanese manufactur-

er Fujitsu Ltd. However, Joseph Zemke, Amdahl's president, notes that the company has spent 12 percent to 17 percent of its revenue on R&D over the last five years, and that last year it spent $150 million on R&D. According to James Porter, president of Disk/Trends (Mountain View, CA), disk drives represent slightly under 30 percent of Amdahl's sales.

Courtesy Storage Technology Corp.

StorageTek CEO Ryal Poppa

Xerox Corp.'s continued domination of the peripherals market notwithstanding, the big news among peripherals makers was last November's merger of Memorex and Telex, which last year ranked second and third, respectively, in that market segment. Memorex itself reached the $1 billion plateau in revenue, a 10 percent increase over its 1986 performance. Telex showed 14 percent growth, with a little over $846 million in revenue.

The newly merged company, known as Memorex Telex, is now the largest of the PCMs. Telex brings to the partnership a booming business in terminals—it was ranked fourth among U.S. terminal makers by International Data Corp. (Framingham, MA). Memorex's strength lies in one of the richest segments of the industry: the disk drive business. Like Amdahl, Memorex spares itself some R&D expenses and has very little manufacturing costs associated with disks; its drives are built with head disk assemblies manufactured by Unisys. Although Memorex's revenues grew by 10 percent, Disk/Trends' Porter says the company's performance continued to be hurt by reliability problems it encountered two years ago with its drives.

StorageTek is 'betting the ranch' on the success of its ACS storage library, according to Poppa.

Although Storage Technology garnered only an 8 percent revenue growth over 1986, Djurdjevic calls it the industry's phoenix. StorageTek, as the vendor calls itself, emerged from Chapter 11 status to turn a modest profit. The vendor refocused its business into what Ryal Poppa, chairman and CEO, calls information storage. StorageTek's business is now focused on solid-state disks, rotating magnetic disks, tape drives, and high-speed printers.

But the vendor is pinning its biggest hopes on its storage library, the 4400 Automated Cartridge System (ACS). StorageTek is "betting the ranch" on the ACS, says Poppa. The ACS, which didn't contribute a cent to StorageTek's 1987 profits, gobbled a little more than half of the 8.5 percent of revenues the vendor pumped into R&D. The remainder was allocated to tape and disk products, which Poppa says contributed the most to StorageTek's profits. The ACS and the new 18-inch Model 4480 tape cartridge stimulated sales for the older nine-track half-inch reel-to-reel tape, the Model 4670. Poppa claims that there was a perceived "mutuality" between all three products.

StorageTek's commitment to the ACS may pay off. According to James Porter, a new triple-capacity IBM 3380-type disk drive (which required about an 8 percent R&D investment), the 4480 cartridge drive, and the library could spell a strong 1988 for StorageTek. Poppa plans on it. Revenue per employee in 1987 was slightly over $90,000, a minimum of $20,000 lower than industry leader IBM. "By the end of 1988, we'll show $100,000 per employee," Poppa asserts.

The R&D wave builds

Like StorageTek, Hewlett-Packard boosted its R&D efforts in 1987. The vendor continued to hold the fifth slot among processor vendors in the DECISIONS survey, showing a 13 percent growth in revenues over 1986. Hewlett-Packard spent $900 million, or 14 percent of its revenues, on R&D last year. The two biggest reasons: its Precision Architecture, based on RISC (reduced instruction set computing) technology, and New Wave, a package for distributed microcomputer environments. According to Bill Murphy, HP's director of marketing and business systems, HP usually invests 10 percent of revenues in R&D, but "saw the opportunity to make a leap in technology." Precision Architecture, he says, "will provide reliability and cost of ownership advantages through the end of the decade."

HP also channeled R&D funds into two other areas: its suite of communications products, which are based on Open System Interconnection standards, and productivity improvements. According to Murphy, HP implemented a corporatewide product improvement platform for its sales force. The program ties all sales personnel to online databases containing data on the availability of products and system configurations for orders.

No doubt Hewlett-Packard is taking these steps to prepare for an aggressive run at DEC. HP is aiming its RISC-based Series 955 minicomputer and right at DEC's high-end VAX 8800 models (see Systems & Peripherals Technology Trends, page 50). The Series 955 processor won't be available until the first half of next year, however.

A newcomer to DECISIONS' peripherals

Processors

'87	'86		'87 Revenues ($000)	'86 Revenues ($000)	Percent Growth	Total '87 Revenues ($000)	Total '87 Profits ($000)
1	1	[illegible]	53,100,000 (E)	49,300,000 (E)	8	54,217,000	5,258,000
2	3	Digital Equipment Corp. *(Maynard, MA)*	10,391,160	8,414,246	23	10,391,160	1,284,321
3	2	[illegible]	9,718,900	9,100,100*	7	9,712,900	578,000
4	4	NCR Corp. *(Dayton, OH)*	5,075,667	4,377,588	16	5,640,667	419,330
5	5	[illegible]	4,488,000 (E)	3,950,000 (E)	13	5,100,000	644,000
6	6	Control Data Corp. *(Minneapolis)*	3,366,500	3,346,700	1	3,366,500	19,300
7	7	[illegible]	2,847,600	2,668,900	14	3,047,600	94,500
8	8	Honeywell Bull Inc. *(Minneapolis)*	2,060,000	1,900,000	8	2,060,000	17,400
9	9	[illegible]	1,303,900	1,287,600	1	1,303,900	(92,000)
10	10	Amdahl Corp. *(Sunnyvale, CA)*	1,234,381	966,349	28	1,234,381	145,985
11	12	[illegible]	1,079,742	837,972	29	1,079,742	102,200
12	11	Prime Computer Inc. *(Natick, MA)*	960,913	860,173	12	960,913	64,768
13	13	[illegible]	895,120 (E)	946,600 (E)	-5	5,594,500	308,500
14	14	National Semiconductor Corp. *(Santa Clara, CA)*	800,000 (E)	700,000 (E)	14	2,067,600	6,600
15	15	[illegible]	687,336	596,685	15	687,336	147,076
16	16	Harris Corp. *(Minneapolis)*	446,000	464,000	-4	2,100,128	92,204
17	17	[illegible]	334,300	287,857	16	334,300	24,830
18	17	Datapoint Corp. *(San Antonio, TX)*	310,842	322,776	-4	310,842	(52,411)
19	18	[illegible]	290,000 (E)	300,000 (E)	-3	933,400	(95,600)
20	20	Recognition Equipment Inc. *(Irving, TX)*	264,658	241,795	9	264,658	13,814
21	21	[illegible]	260,490	235,845	10	260,490	10,266
22	25	Stratus Computer Inc. *(Marlboro, MA)*	184,150	124,559	48	184,150	19,395
23	22	[illegible]	174,285	186,837	-7	361,454	(16,471)
24	23	Altos Computer Systems *(San Jose, CA)*	168,291	139,461	21	168,291	14,428
25	24	[illegible]	148,394	129,857	15	148,394	11,320
26	—	CPT Corp. *(Minneapolis)*	102,645	103,719	-1	102,645	(31,043)
27	—	[illegible]	101,564	112,588	-10	101,564	(23,377)
28	—	Floating Point Systems Inc. *(Portland, OR)*	84,269	88,579 (R)	-5	84,269	(29,241)
29	—	[illegible]	82,833	N/A	N/A	82,833	9,358
30	—	Teradata Corp. *(Los Angeles)*	61,580	31,357	96	61,580	6,916
		[illegible]	100,184,118	92,020,847	9		
		Processors without [illegible]	46,884,118	42,720,847	13		

*pro forma figure **formerly Monarch Data Sciences Corp.

Peripherals

'87	'86		'87 Revenues ($000)	'86 Revenues ($000)	Percent Growth	Total '87 Revenues ($000)	Total '87 Profits ($000)
1	1	Xerox Corp. *(Stamford, CT)*	2,200,000	1,890,000	16	15,125,000	578,000
2	2	[illegible]	1,000,000	906,000	10	1,000,000	N/A
3	3	Telex Corp.* *(Tulsa, OK)*	846,683	741,621	14	846,683	N/A
4	4	[illegible]	750,028	696,009	8	750,028	26,006
5	—	Alcatel Business Systems Group *(San Jose, CA)*	500,000	N/A	N/A	500,000	N/A
6	7	[illegible]	388,735	234,750 (R)	66	388,735	25,331
7	10	National Computer Systems Inc. *(Minneapolis)*	203,700	197,610	3	203,700	23,947
8	8	[illegible]	191,400	195,083	-2	191,400	(23,300)
9	6	Bell & Howell Inc. *(Skokie, IL)*	179,200	239,700	-25	726,869	61,365
10	—	[illegible]	127,566	66,588	91	127,566	38,241
11	12	System Industries Inc. *(Milpitas, CA)*	121,264	109,308	11	121,264	4,800
12	11	[illegible]	100,564	109,443	-8	405,294	(3,404)
		Total Peripherals	6,613,360	5,386,112	23		

*merged in November 1987 to form Memorex Telex

Scientific & Engineering

'87	'86		'87 Revenues ($000)	'86 Revenues ($000)	Percent Growth	Total '87 Revenues ($000)	Total '87 Profits ($000)
1	2	[illegible]	785,900	342,700	121	785,900	48,000
2	1	Intergraph Corp. *(Huntsville, AL)*	641,083	605,737	6	641,083	69,876
3	3	[illegible]	640,000	366,000	86	11,321,000	421,000
4	2	Computervision Corp.* *(Bedford, MA)*	564,028	494,672	14	564,028	19,480
5	4	[illegible]	553,660	391,685	41	553,660	21,892
6	5	Tektronix Inc. *(Beaverton, OR)*	476,843	517,100	-8	1,388,853	25,677
7	8	[illegible]	239,349	209,075	14	239,349	20,516
8	—	Silicon Graphics *(Mountain View, CA)*	115,969	59,340	95	115,969	11,916
9	9	[illegible]	103,538	95,956	8	103,538	(13,970)
10	—	Convex Computer *(Richardson, TX)*	69,647	40,200	73	69,647	8,845
11	10	[illegible]	66,586	60,907	9	66,586	(25,905)
12	—	Alliant Computer Systems Corp. *(Acton, MA)*	53,798	30,764	75	53,798	6,851
		[illegible]	4,288,991	3,234,136	32		

*merged recently with Prime Computer Inc. (E) Estimated (R) Restated *Annual revenues are based on four quarters ending December 1986 and December 1987*

ranking is EMC Corp., which checks in at 10th place. EMC, founded in 1979, produces memory expansion boards, main storage upgrades, disk subsystems, workstation controllers, and diagnostic software. Its products enhance DEC VAXs, IBM systems from the System/36 to 308X mainframes and 3880 cache controllers, and Hewlett-Packard, Prime Computer Inc., and Wang Laboratories Inc. minis. EMC's sales shot up 91 percent over 1986, to better than $127 million.

Courtesy Sun Microsystems

Sun chairman Scott McNealy

Higher-than-average R&D expenditures are 'much of what gives Sun the competitive edge.'

Terminal life

In 1987, terminal makers defied industry prognosticators, who had anticipated that microcomputers would flatten the terminal market. Apparently, some users are concluding that the high functionality of the micro isn't always an appropriate replacement for the terminal. Still, micro emulation boards accounted for 30 percent of the IBM 3270 terminal market, according to Leslie Lord, senior analyst for terminals at International Data Corp. The increase in sales of midrange processors also generated sales for the terminals that hang off them. Equally important, the terminal replacement cycle has shortened from approximately seven years to five years, and 1987 was the year that cycle hit, says Eileen O'Brien, IDC's senior analyst for ASCII and ANSI terminals.

In the ANSI terminal market, according to IDC, DEC maintained the top position, despite a 0.7 percent loss of market share. Wyse Technology, meanwhile, added to 2 percent to its ANSI terminal market share, and now controls 22.8 percent of that market. In the ASCII terminal market, Wyse held firm in the number-one slot, increasing its share by 4 percent, to 26.7 percent.

But it wasn't rosy times across the board for terminal vendors. Lee Data Corp. and Esprit Systems Inc. suffered 1987 losses of 4 percent and 2 percent, respectively. According to O'Brien, Esprit brought its new product to market too late to change its fortune, while Lee Data was stung by the fact that it offers systems-compatible terminals that require the purchase of controllers. Lee Data did deliver a plug-compatible last year, Lord notes, but not in time to reverse its 1987 financial plight.

Among vendors of scientific and engineering systems, Sun Microsystems Inc. rose from the number-six position to the top of the list, garnering a 121 percent growth in revenues above 1986. Laura Conigliaro, first vice president at Prudential-Bache Securities, credits Sun's emergence to the fact that it "has headed up the irrevocable drive within the computing industry toward distributed computing and open systems."

Blessed with such massive growth, Sun is now beset with controlling it—perhaps the one area that analysts look to with caution. According to Conigliaro, Sun can't possibly put the same kind of priority on its internal structure as it puts on technology and product growth. Nevertheless, she lauds Sun's care in adding new personnel. Austin Mayer, director of industrial relations at Sun, says the company adds about 250 employees per month to its payrolls. Thus far, growth hasn't come at the expense of productivity. In 1983, Sun's revenue per employee was $89,000; in 1987, it reached $126,000. According to Mayer, in the first nine months of fiscal 1988, Sun produced $141,000 in revenue per employee.

Last year, Sun spent about $70 million on R&D, with about half allocated to hardware. Financial analysts often criticize Sun for its heavy R&D spending; Sun spends about 14 percent of revenue on R&D, compared with typical expenditures of about 9 percent. Mayer counters that "R&D expenditures are much of what gives Sun the competitive edge."

With product life cycles that range from 12 months to 15 months, substantially lower than the industry's three- to five-year norm, Sun has no intention of curtailing R&D expenditures. Sun will boost R&D expenditures in 1988 to about $125 million, says Mayer. The largest portion will be dedicated to graphics development, but an increasing amount will be dedicated to Unix.

Apollo Computer Inc. knows what getting to the Unix gate—and not getting to it—can mean. By marketing a proprietary operating system until 1985, Apollo almost missed the race toward Unix and open systems. Reputations are neither made nor shaken easily in this business. According to Conigliaro, it has taken time for Apollo to be recognized in the Unix market, while Sun has been the standard-bearer. Sun, she says, has exploited the technology well.

That's a lesson that a number of vendors seem to have learned. D

Laura Daly, a free-lance editor based in Maywood, NJ, contributed to this performance report.

I/S ON TELECOMM: SHOW ME

Corporate information managers won't invest in new telecomm equipment and services without a clearer read on their value.

by Patrick Flanagan

Results from the first five DECISIONS/Paine Webber Surveys of MIS Attitudes suggest that telecommunications vendors are having a hard time convincing information executives that the leading edge of telecomm technology is the place to be.

Clearly, information executives are taking a conservative approach to telecommunications, according to responses to the quarterly surveys conducted by DECISIONS and Paine Webber Inc., New York. Consider the following generalizations drawn from survey data:

- While the major communications carriers invest billions in digital facilities, respondents are only slowly switching from analog systems.
- Despite efforts by alternative carriers, particularly US Sprint, to promote the quality of fiberoptic links, respondents still put more stock in low prices than line quality.
- Respondents apparently don't value having a wide range of choices in telecommunications equipment; they're consolidating spending with AT&T, IBM/Rolm, and Northern Telecom Inc.

The five DECISIONS/Paine Webber surveys conducted to date cover the second quarter of 1987 through the second quarter of this year. Respondents to the survey view telecomm from a broad perspective; only about 40 percent have the direct responsibility for telecommunications associated with telecomm managers.

The conservative bent of the group covered by the surveys is most evident in data on the use of digital technology for voice and data transmissions. Conversion from analog to digital systems was expected to be a major trend in

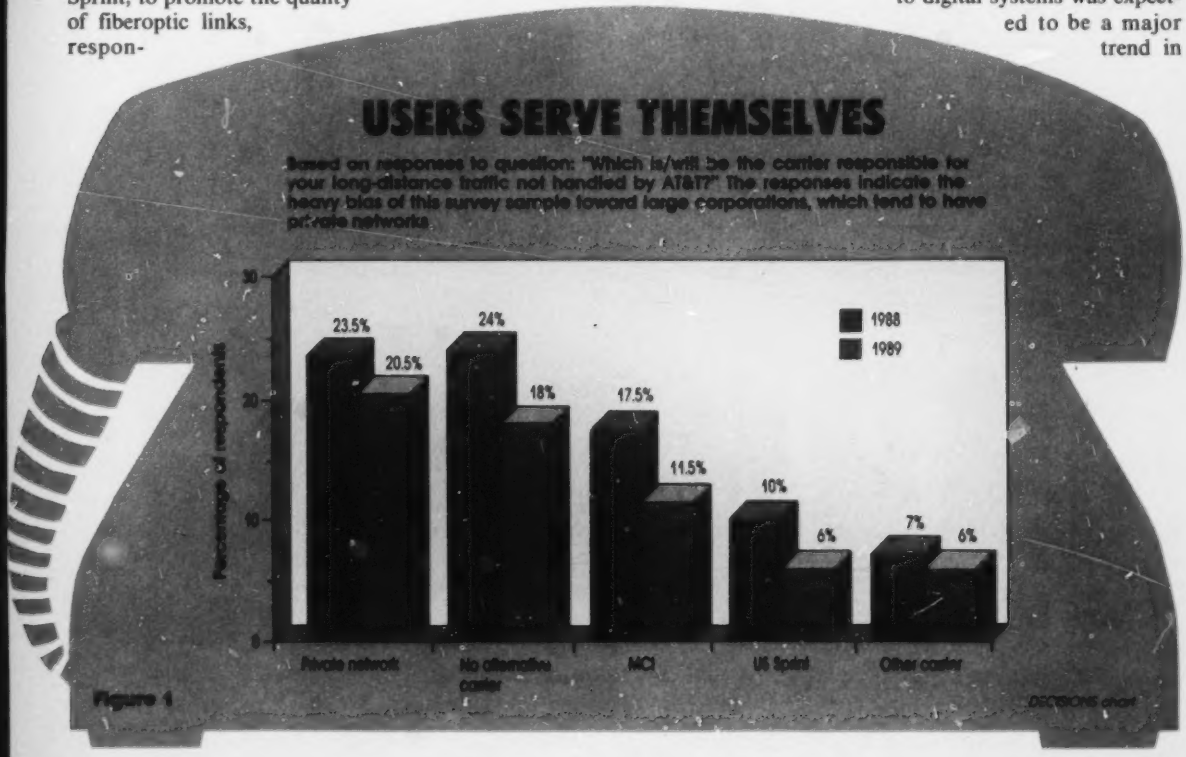


Figure 1

the wake of the AT&T divestiture. Yet survey respondents indicate their corporate use of digital facilities has increased at a rate much slower than the rate at which carrier dollars are being poured into the technology.

Survey respondents indicating that more than 50 percent of their organization's voice traffic was digital in nature grew to 49 percent from 38 percent between February 1987 and February 1988, the period covered by the surveys. The pendulum is slowly swinging toward higher percentages of data transmission as compared with voice. The number of respondents reporting that voice comprised 90 percent or more of total communications volume in their organizations dropped by 5.5 percent during the period.

"The carriers are betting on any new applications going into digital as well as on converting existing [analog] demand," says Jack Grubman, telecommunications analyst at Paine Webber. "Demand for digital is growing as more applications require integration of voice and data."

In some quarters, anyway. Among survey respondents, there's a real split between heavy and light spenders on digital systems. Major corporations are leading the way with advanced applications, and they're implementing digital facilities to support them. Howard Frank, chairman of Network Management Inc., Fairfax, VA, notes that corporations with large private networks typically require enough capacity to make investments in digital facilities pay off.

Westinghouse Corp., the giant Pittsburgh-based conglomerate, is an example. "Since divestiture, no single vendor can provide the range of services we provide ourselves at the cost we're paying," says Tom O'Toole, manager of telecommunications systems. Westinghouse's in-house network includes a 10-node private network, T-1 multiplexer connections to 90 locations, and an internal phone system with direct dial-in access from the outside. "We've essentially got our own area code," says O'Toole.

But a large part of the market—medium-sized companies and even some large corporations—is moving much more slowly to digital communications. The large majority of data transmissions continue to be analog-based, and the volume of data communications is too small to justify replacing modems with direct digital connections.

Rob Marsicek, data processing manager for Mannesmann Tally, a printer manufacturer in Kent, WA, expresses a typical sentiment. Mannesmann Tally's single warehouse is served by one dialup modem. Most of the

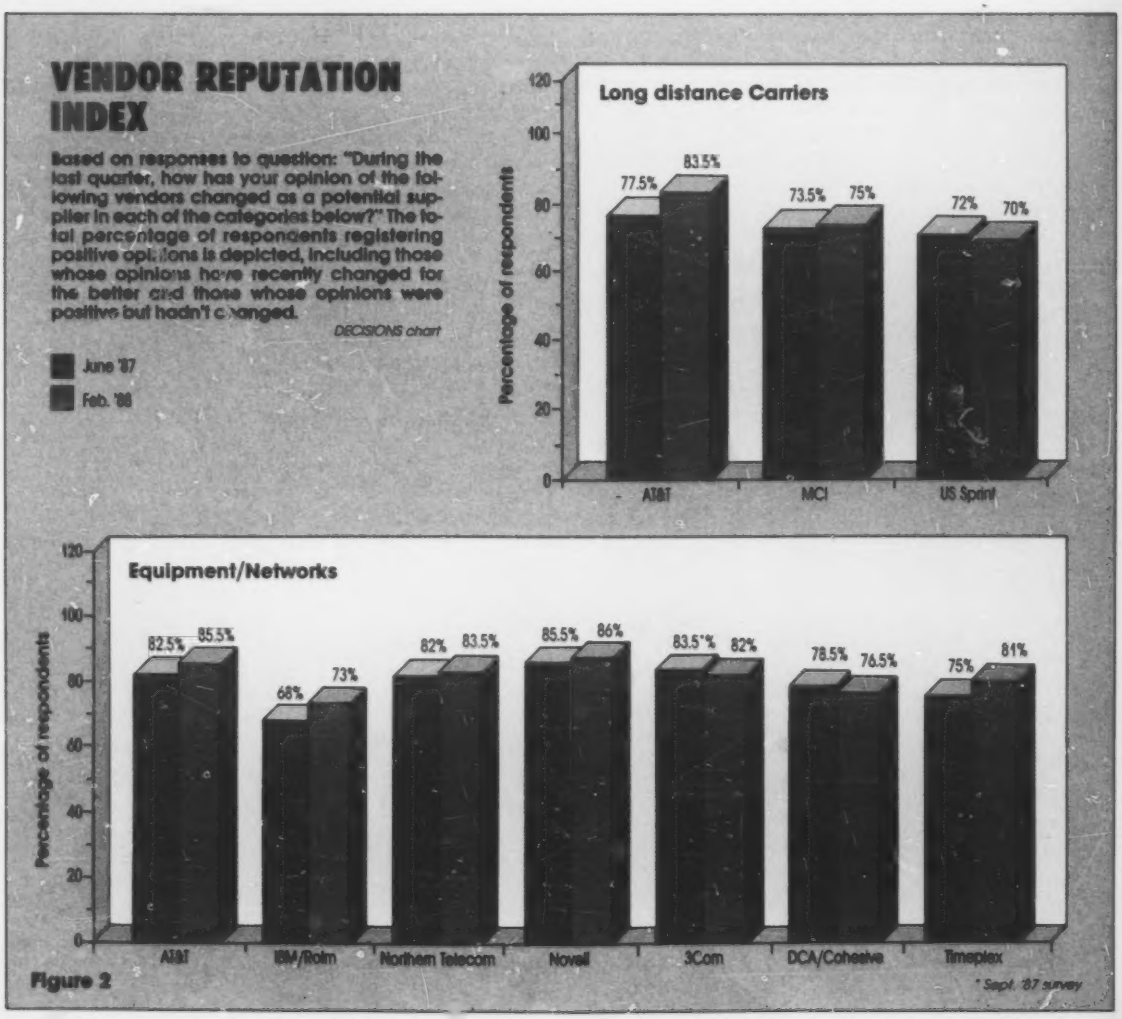


Figure 2

company's communications volume is voice and facsimile. Marsicek sees no real need to upgrade his private branch exchange or junk his modem. "Telecomm is a pretty flashy industry with lots of aggressive salesmen," he says. "What they haven't done is give us a valid reason to do anything differently than we're doing now."

Frank believes the carriers have a big marketing hurdle to overcome. "Digital [communications] doesn't do that much for users compared with the last generation of analog systems," he says. The improved error rates of digital facilities, for example, aren't important for voice except in the rare case when transmission errors prevent a connection. Also, there's no cost advantage in moving to digital except in huge private networks, Frank says.

The importance of low prices to users was borne out by responses to other parts of the surveys. Last June, respondents to the DECISIONS/Paine Webber survey were asked for the primary reason that they would give more of their long-distance business to an alternative carrier. For 54 percent of the respondents, price was the reason. Only 23 percent indicated quality of connections as a reason, and just 4 percent cited the availability of fiberoptic lines.

At first look, these results support the argument that communications capacity has become a commodity sold on price alone. However, that's probably only part true. Responses to a second question on the June 1987 survey suggest price discounts don't move respondents unless they are deep. The question asked respondents what discounts from AT&T's rates are adequate from an alternative long-distance carrier, assuming technical equivalence. Over 40 percent cited discounts of 10 percent or more, and 39 percent wanted markdowns in the 6 percent to 10 percent range.

Results from the most recent survey suggest that MCI Corp., US Sprint, and the other common carriers will be competing for a static share of corporate telecomm budgets. Respondents to the latest survey report that MCI and US Sprint together will comprise 27.5 percent of the traffic carried by alternative carriers during the next year. They expect their in-house networks, on the other hand, to carry 23.5 percent of their non-AT&T traffic. And 24 percent say they don't expect to use an alternative carrier during the next year (see Figure 1).

With the exception of AT&T, vendors vary greatly in

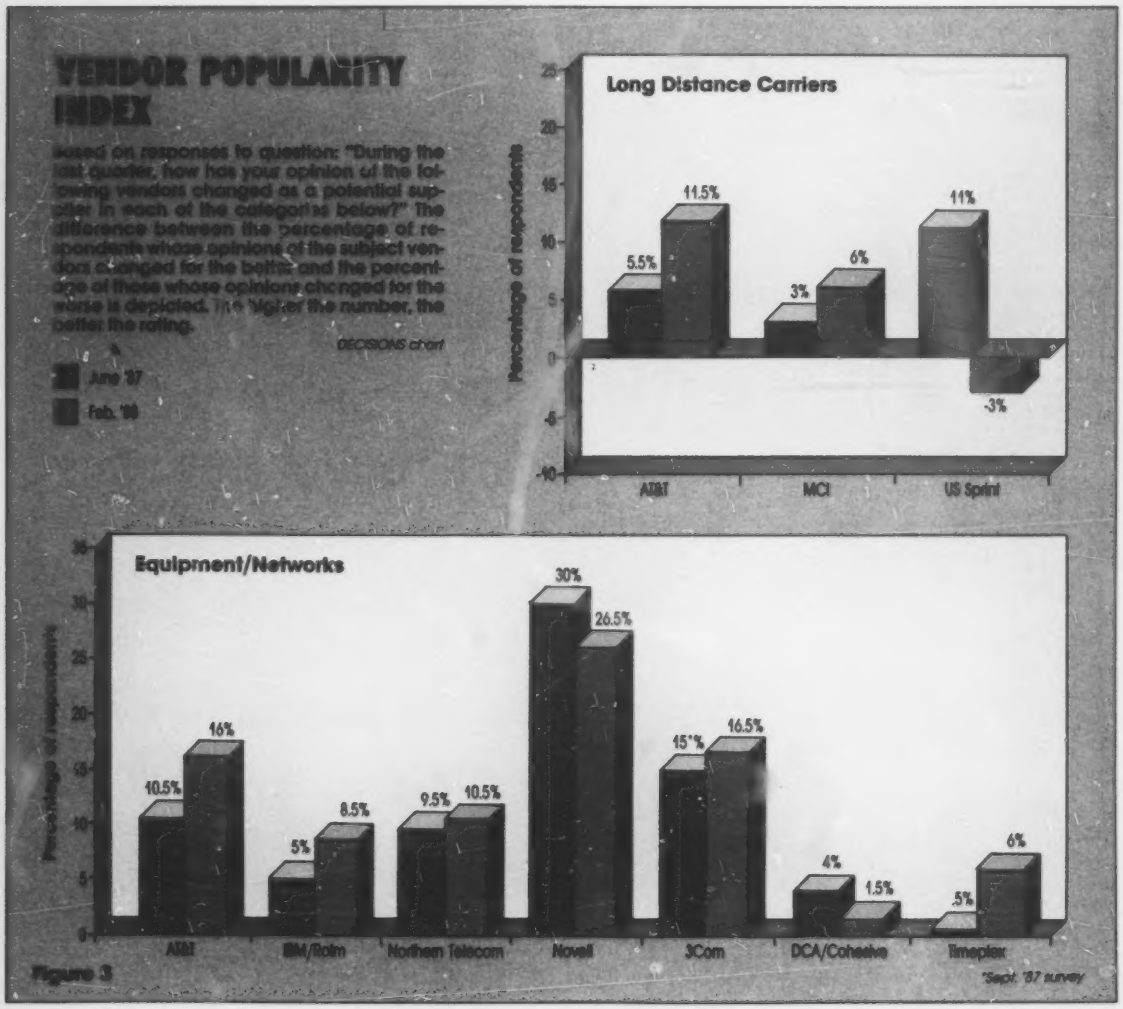


Figure 3

terms of how users view their popularity and reputation. The two primary competitors to AT&T in the switching area, IBM/Rolm and Northern Telecom (Nashville, TN), are enjoying high degrees of popularity and reputation. Novell Inc. (Orem, UT), which is riding the LAN trend, has come on the strongest in terms of popularity, and has also showed strength in reputation rating. Its prime competitor, 3Com Corp. (Santa Clara, CA), is also getting favorable reviews.

"There is a consolidation going on in the large-scale systems market sector," Grubman says. "My hunch is that AT&T, IBM/Rolm, and Novell will emerge as the leaders. Grubman is bearish on T-1 equipment suppliers. "T-1 multiplexers were the hot boxes a few years ago, but vendors are finding that smaller companies don't have the technological expertise to take full advantage of T-1 capabilities," he asserts. Grubman expects AT&T, MCI, US Sprint, and the regional carriers to offer more data capabilities on their public networks as an alternative to internal use of T-1 technology.

Results from the DECISIONS/Paine Webber surveys also permit the calculation of indexes that indicate a vendor's relative popularity and reputation among respondents. Popularity is measured by subtracting the difference between the percentage of respondents who said their opinion of a vendor changed for the worse during the quarter from the percentage who said their opinion changed for the better. Reputation is measured by adding the percentage of respondents who said their opinion of a vendor changed for the better to the percentage of those whose opinions were positive but unchanged.

AT&T over the past four quarters has both a solid popularity and reputation index as a carrier, showing particular strength in the first quarter of this year. MCI has also come on positively in terms of reputation. For US Sprint, a drop in popularity probably stems from that carrier's well-reported management, billing, and customer service problems that may or may not be on the way to resolution.

AT&T will certainly withstand the onslaught of MCI, US Sprint, and other carriers, says Grubman. "AT&T is tenacious as hell, particularly among corporate customers," he says. "It is going to get even more flexible in its pricing of services, and as a consequence is going to be a tougher and tougher competitor." D

I/S COMM. SPENDING: WHO'S GAINING

Based on responses to question: "How much will your spending with the following vendors change during the next 12 months, compared with the last 12 months?" Growth in spending—and therefore, vendor revenues—is indicated by the "increase" category. A high percentage of "no change" for every vendor suggests overall growth will be moderate.

DECISIONS chart

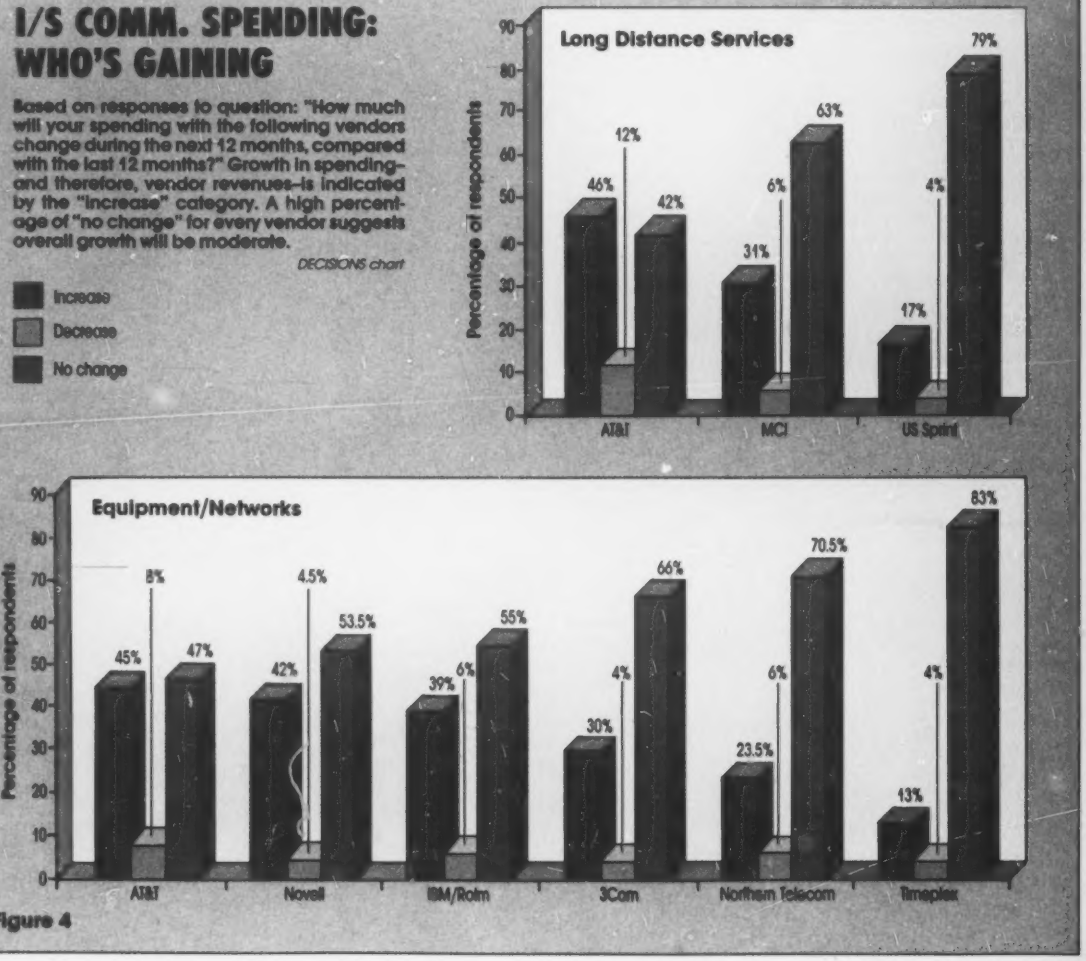


Figure 4